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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 10/047,992
Filing Date: January 17, 2002
Appellant(s): OHASHI ET AL.

Darren Crew
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 12, 2008 appealing from the Office action mailed January 8, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,656,048	KUDOH ET AL.	04-1987
6,520,402	ORME-MARMERELIS ET	02-2003
	AL.	

5,746,844	STERETT ET AL.	05-1998
6,309,711	TSENG ET AL.	10-2001
6,501,663	PAN	12-2002

JP 11-040937 KUWABARA ET AL. "METHOD AND APPARATUS FOR FEEDING
SOLDER"

JP 10-226803 KATUSMI ET AL. "THREE DIMENSIONAL STRUCTURAL BODY"

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sterett et al. (5,746,844) in combination with Kudoh et al. (4,656,048) further in combination with Tseng et al. (6,309,711).

Sterett et al. (5,746,844) teaches a method and apparatus for creating a three dimensional article using a layer-by-layer deposition of molten metal and annealing. The molten metal is applied by depositing the droplets in a predetermined pattern and rate (abstract). Regarding the movement in the X-axis, Y-axis and Z-axis, Sterett et al. (5,746,844) (col. 8, lines 11-40) teaches this limitation.

Sterett et al. (5,746,844) fails to teach measuring and comparing data calculated by a monitoring device to control the deposited material, i.e. a feedback loop.

Kudoh et al. (4,656,048) teaches a method of forming thick film circuit patterns with a sufficiently wide and uniform strip. The monitoring system measures and controls the distance of the nozzle from the substrate and compares that to a set value and performs and necessary changes to maintain the desired value (col. 2, lines 30-40, col. 3, line 55 – col. 4, line 35). Regarding the movement in the X-axis, Y-axis and Z-axis, Kudoh et al. (4,656,048) (col. 4, line 47-col. 5, line 20 and Fig. 14) teaches this limitation.

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Sterett et al. (5,746,844) deposition process by incorporating a measuring/control system as evidenced by Kudoh et al. (4,656,048) to produce the desired circuit pattern.

Sterett et al. (5,746,844) in combination with Kudoh et al. (4,656,048) fail to disclosed the molten metal grains overlapping one another.

Tseng et al. (6,309,711) teaches a method of manufacturing a three-dimensional object whereby molten metal is jetted toward a substrate whereby the metal deposits are overlapping (abstract and Fig. 2).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Sterett et al. (5,746,844) in combination with Kudoh et al. (4,656,048) process by applying the molten metal material to be in overlapping fashion as evidenced by Tseng et al. (6,309,711) with the expectation of achieving the similar results, i.e. a conductive circuit. Furthermore, Sterett et al. (5,746,844) teaches or depicts droplet applied to a substrate being overlapped (Fig. 2).

Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orme-Marmerelis et al. (6,520,402) or JP 10-226,803 in combination with Kudoh et al. (4,656,048) further in combination with Tseng et al. (6,309,711).

Orme-Marmerelis et al. (6,520,402) teaches a high speed direct writing with metallic microspheres. Small droplets of molten metal are generated toward a substrate to form conductive traces (abstract). Regarding the movement in the X-axis, Y-axis and Z-axis, Orme-Marmerelis et al. (6,520,402) (Figs. 3A, 3B and col. 7, lines 18-23) teaches this limitation.

JP 10-226,803 teaches a three dimensional body formed by various kinds of materials. Molten metal is spouted from a nozzle (10) to form droplets (20) that are applied to a substrate to form electric circuits (abstract).

Orme-Marmerelis et al. (6,520,402) or JP 10-226,803 fail to teach measuring and comparing data calculated by a monitoring device to control the deposited material.

Features described concerning Kudoh et al. (4,656,048) above are incorporated here.

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Orme-Marmerelis et al. (6,520,402) or JP 10-226,803 deposition process by incorporating a measuring/control system as evidenced by Kudoh et al. (4,656,048) to produce the desired circuit pattern.

Orme-Marmerelis et al. (6,520,402) or JP 10-226,803 in combination with Kudoh et al. (4,656,048) fail to disclosed the molten metal grains overlapping one another.

Tseng et al. (6,309,711) teaches a method of manufacturing a three-dimensional object whereby molten metal is jetted toward a substrate whereby the metal deposits are overlapping (abstract and Fig. 2).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Orme-Marmerelis et al. (6,520,402) or JP 10-226,803 in combination with Kudoh et al. (4,656,048) process by applying the molten metal material to be in overlapping fashion as evidenced by Tseng et al. (6,309,711) with the expectation of achieving the similar results, i.e. a conductive circuit.

Claims 7,8,17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orme-Marmerelis et al. (6,520,402), Sterett et al. (5,746,844) or JP 10-226,803 in combination with Kudoh et al. (4,656,048) further in combination with Tseng et al. (6,309,711) further in combination with Pan (6,501,663).

Features described above concerning Orme-Marmerelis et al. (6,520,402), Sterett et al. (5,746,844) or JP 10-226,803 in combination with Kudoh et al. (4,656,048) further in combination with Tseng et al. (6,309,711) are incorporated here.

Orme-Marmerelis et al. (6,520,402), Sterett et al. (5,746,844) or JP 10-226,803 in combination with Kudoh et al. (4,656,048) further in combination with Tseng et al. (6,309,711) fail to specifically teach forming an insulating layer atop the molten layer.

Pan (6,501,663) teaches a three dimensional interconnect whereby an interconnect is covered with an insulator layer to protect the interconnect (abstract and Figs 5-7). Regarding the movement in the X-axis, Y-axis and Z-axis, Pan (6,501,663) (Fig. 19 and col. 12, line 18 – col. 13, line 13) teaches this limitation.

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Orme-Marmerelis et al. (6,520,402), Sterett et al. (5,746,844) or JP

10-226,803 in combination with Kudoh et al. (4,656,048) further in combination with Tseng et al. (6,309,711) by incorporating an insulator layer atop the molten metal circuit layer as evidenced by Pan (6,501,663) with the expectation of achieving a multilayered structure or a protective layer for the circuitry.

Claims 51-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orme-Marmerelis et al. (6,520,402), Sterett et al. (5,746,844) or JP 10-226,803 in combination with Kudoh et al. (4,656,048) further in combination with Tseng et al. (6,309,711) still further in combination with JP 11-040937.

Features described above concerning references Orme-Marmerelis et al. (6,520,402), Sterett et al. (5,746,844), JP 10-226,803, Kudoh et al. (4,656,048) and Tseng et al. (6,309,711) are incorporated here.

Orme-Marmerelis et al. (6,520,402), Sterett et al. (5,746,844) or JP 10-226,803 in combination with Kudoh et al. (4,656,048) further in combination with Tseng et al. (6,309,711) fail to specifically teach using compressed air for jetting the molten metal and using a mask to deposit the molten metal on a desired location of the substrate.

JP 11-040937 teaches injecting compressed gas in a pot of molten solder to jet the solder through a mask and onto a substrate (abstract).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Orme-Marmerelis et al. (6,520,402), Sterett et al. (5,746,844) or JP 10-226,803 in combination with Kudoh et al. (4,656,048) further in combination with Tseng et

al. (6,309,711) process by incorporating a compressed gas to aid in the jetting of molten metal as well as the use of a mask to provide a desired pattern as evidenced by JP 11-040937.

While the Examiner acknowledges the fact that JP 11-040937 teaches molten metal whereas the instant claims are directed toward a molten metal for circuitry, it is the Examiner's position that the process disclosed is not limited to the material utilized. In fact, one skilled in the art at the time the invention was made would have had a reasonable expectation of achieving similar results with any molten "material".

(10) Response to Argument

Appellant argues that the prior art fails to "a method comprising the step of converting the data of the coordinate system having the origin located at any position of the machine to a second set of data associated with a reference coordinate system provided in the construction member or on the intermediate member disposed on a transfer unit and having the origin in the member provided,..., wherein the molten metal is jetted from a nozzle and both the nozzle and the construction member have X, Y, Z axes perpendicular to each other, the nozzle being movable along each of the X, Y, Z axes, the nozzle moving in a circumferential direction around each of the X axis and the Y axis, and the construction member being movable along each of the X, Y, Z axes and also in a circumferential direction around each of the X, Y, Z axes".

The Examiner disagrees. As pointed out in Kudoh et al. (4,656,048) which teaches a monitoring system measuring and controlling the distance of the nozzle from the substrate and compares that to a set value and performs and necessary changes to maintain the desired value (col. 2, lines 30-40, col. 3, line 55 – col. 4, line 35). Therefore the measured set of values is the first or reference coordination system and the second set of three dimensional data is the values

that are changed in response to the controlling done with a feedback loop (col. 3, lines 55 - col. 4, line 12). Furthermore, Sterett et al. (5,746,844) teaches a positioning system whereby encoding means for receiving and transmitting positional data is utilized with the use of a control system.

Appellant argued that the Examiner did not properly address how the cited art teaches the claimed invention in the Advisory Action filed April 25, 2008.

The Examiner disagrees. As noted in the Advisory Action, the Final rejection applied by the Examiner teaches the limitations and the Examiner was directing Appellant to the Office Action for sake of brevity. As detailed above, the Examiner clearly details how the prior art teaches “a second set of dimensional data” as the prior art teaches a control feedback system whereby one set of values is controlled by measuring/comparing and modifying the first set of values to a “desired” second set of values to achieve the desired result. This would constitute the teaching of converting a first set of three dimensional data to a second set of three dimensional data.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

Art Unit: 1792

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Brian K Talbot/

Primary Examiner, Art Unit 1792

Conferees:

/Michael Barr/

Supervisory Patent Examiner, Art Unit 1792

/Timothy H Meeks/

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